

MA5165 STATISTICAL METHODS FOR ENGINEERS

DETAILED SYLLABUS

UNIT I ESTIMATION THEORY

Estimators: Unbiasedness, Consistency, Efficiency and sufficiency – Maximum likelihood estimation – Method of moments.

UNIT II TESTING OF HYPOTHESIS

Sampling distributions - Small and large samples -Tests based on Normal, t, Chi square, and F distributions for testing of means, variance and proportions – Analysis of r x c tables – Goodness of fit.

UNIT III CORRELATION AND REGRESSION

Multiple and partial correlation – Method of least squares – Plane of regression – Properties of residuals – Coefficient of multiple correlation – Coefficient of partial correlation – Multiple correlation with total and partial correlations – Regression and partial correlations in terms of lower order co-efficient.

UNIT IV DESIGN OF EXPERIMENTS

Analysis of variance – One way and two way classifications – Completely randomized design – Randomized block design – Latin square design – 2² Factorial design.

UNIT V MULTIVARIATE ANALYSIS

Random vectors and matrices – Mean vectors and covariance matrices – Multivariate normal density and its properties – Principal components: Population principal components – Principal components from standardized variables.

REFERENCES

1. Gupta.S.C., and Kapoor, V.K., “Fundamentals of Mathematical Statistics”, Sultan Chand and Sons, 11th Edition, 2002.
2. Jay L. Devore, “Probability and statistics for Engineering and the Sciences”, 8th Edition, Cengage Learning, 2014.

For Syllabus, Question Papers, Notes & many More

3. Johnson, R.A. and Wichern, D. W. "Applied Multivariate Statistical Analysis", Pearson Education, Asia, 6th Edition, 2007.
4. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.
5. Rice, J.A. "Mathematical Statistics and Data Analysis", 3rd Edition, Cengage Learning, 2015.

OBJECTIVES

This course is designed to provide the solid foundation on topics in various statistical methods which form the basis for many other areas in the mathematical sciences including statistics, modern optimization methods and risk modeling. It is framed to address the issues and the principles of estimation theory, testing of hypothesis, correlation and regression, design of experiments and multivariate analysis.